

MNPE-09425068494

In Collaboration with

**Karnataka State Open
University**

Manasagangotri, Mysore-6

**Syllabus
Certificate in Welder**

www.maanarmadaedu.org

Certificate in Welder

Program Structure (Face to Face)

ELIGIBILITY - 10th Class pass under 10+2 system.

COURSE PERIOD: SIX MONTHS

TOTAL MARKS: 600

TOTAL SEMESTER : 1

SUBJECT TITLE	SUBJECT CODE	MARKS		
		Theory	Practical	Total
BASIC WELDING (GAS & ARC)	CWL-101	50	50	100
GAS CUTTING	CWL-102	50	50	100
TIG WELDING	CWL-103	50	50	100
MAC/CO ₂ WELDING	CWL-104	50	50	100
WORKSHOP CALCULATIO & SCIENCE	CWL-105	50	50	100
PRACTICAL	CWL-106		100	100

1 ST SEMESTER		
Code	COURSE TITLE	CREDITS
CWL101	BASIC WELDING WORKS (GAS & ARC WELDING)	3
CWL 102	GAS CUTTING	3
CWL 103	TIG WELDING	3
CWL 104	MAC/ CO ₂ WELDING	3
CWL 105	WORKSHOP CALCULATION & SCIENCE	3
CWL 106	PRACTICAL	3
TOTAL CREDIT		18

DETAILED SYLLABUS

CWL 101 : Basic Welding (Gas & Arc Welding)

Total Credit :3

Block – 1

Unit-1

- Reading of fabrication drawing.
- Introduction to welding
- Safety precautions

Unit-2

- Types of welding processes and application
- Nomenclature of Fillet and groove welds

Unit-3

- Welding terms, symbols and definitions
- Description operating procedures of oxy-Acetylene welding .
- Description and safe operating procedures of oxy-acetylene regulators
- Description & maintenance of oxy Acetylene welding blow pipes

Unit-4

- Types of Oxy-Acetylene flames and their uses.
- Filler rods and fluxes for brazing
- Welding & Brazing Procedure and technique
- Welding defects causes and remedy
- Distortion and methods of control
- Inspection & testing of Welding elements

Block – 2

Unit-1

- Principles of Manual Metal Arc Welding (MMAW)
- Advantages and limitations.

Unit-2

- Basic Electricity applicable to welding
- Arc welding power source, AC Transformers, DC welding rectifier, DC generators

Unit-3

- Types of welding joints and edge preparation

Unit-4

- Welding electrodes and selection
- Coding of MMAW electrodes

Block-3

Unit-1

- Arc welding procedure and technique
- Welding defects causes and remedy
- Distortion and methods of control
- Welding symbols
- Inspection & testing of welding elements

Unit-2

- Use of protective safety devices on shop floor
- Safe working practice to be observed during welding
- Identification of tools and accessories used for Gas welding & Arc Welding
- Setting up of Gas Welding Plant & Arc Welding Plant
- Lighting and adjustment of Oxy-Acetylene flame & operation
- Beading practice on MS sheet with and without filler rod
- Produce oxy-acetylene gas welded joints in mild steel sheets
 - Edge joint
 - Square butt joint
 - Fillet joint

Unit-3

- Identification of defects by Visual inspection & correction of defects
- Striking an arc and depositing straight and wearing beads on MS in Flat position
- Preparation of joints, edge operations.

Unit-4

- Produce arc welded joints in mild steel in flat position
 - Fillet Lap & T joints
 - Inside corner joint
 - Square butt joint
 - Single „V“ but joint
- Identification of defects by Visual inspection & correction of defects

CWL 102 : Gas Cutting

Total Credit: 3

Block 1

Unit 1

- Reading of fabrication drawing.
- Description & use of measuring & marking tools

Unit 2

- Types of Oxy-Acetylene flames and their uses.

Unit 3

- Types of welding joints and edge preparation

Unit 4

- Safety precautions.

Block 2

Unit 1

- Description operating procedures of oxy-Acetylene cutting plant.
- Description and safe operating procedures of oxy-acetylene regulators
- Description & maintenance of oxy Acetylene cutting torches

Unit 2

- Principles of Oxy Acetylene cutting process
- Principles of Template & Profile cutting

Unit 3

- Cutting defects causes and remedy

Unit 4

- Inspection.

Block 3

Unit-1

- Use of protective safety devices on shop floor
- Safe working practice to be observed during welding.

Unit-2

- Identification of tools and accessories used for Gas cutting
- Setting up of Gas Cutting Plant
- Lighting and adjustment of Oxy-Acetylene flame & operation
- Practicing cutting on M.S. plate

Unit 3

- Cutting in flat horizontal and vertical positions
- Cutting nozzle selections (straight and angle cutting) for different thickness

Unit-4

- Practice on Circular Cutting
- Produce joints according to required size.
- Identification of defects by Visual inspection & correction.

CWL 103: TIG Welding

Total Credit : 3

Block 1

Unit-1

- Introduction to welding

Unit-2

- Types of welding processes and application

Unit-3

- Nomenclature of Fillet and groove welds

Unit-4

- Welding terms and definitions

Block 2

Unit-1

- Introduction to TIG welding & its application

Unit-2

- Advantages of TIG welding process
- Power source – Types, polarity and application

Unit-3

- Accessories - HF unit and DC suppressor.

Unit-4

- Tungsten electrode, Types, sizes, and uses.

Block 3

Unit1

- Type of shielding gases
- Advantages of root pass welding of pipes by TIG welding

Unit-2

- Purging Methods
- Tables / Data relating to TIG welding.
- Trouble shooting

Unit-3

- Types of weld defects, causes and remedy
- Welding Symbols
- Inspection and testing of weldments

Unit-4

- Introduction to safety equipment and their use
- Setting up of AC and DC TIG Welding Plant
- Beading practice on plate on MS sheet Welding

CWL 104: MAC/CO₂ Welding

Total Credit : 3

Block 1

Unit 1

- Introduction to welding
- Types of welding processes and application

Unit 2

- Nomenclature of Fillet and groove welds
- Welding terms and definitions

Unit 3

- Introduction to MAG/ CO₂ welding
- Power source & accessories

Unit 4

- Wire Feed unit
- Welding Gun & its parts

Block 2

Unit 1

- Modes of metal transfer – Dip, Globular, spray
- Welding wire types and specification

Unit 2

- Types of shielding gases & its importance

Unit 3

- Principles & applications of Flux cored arc welding

Unit 4

- Trouble shooting in MAG/CO₂ welding

Block 3

Unit 1

- Data and Tables related to CO₂ welding

Unit 2

- Types of weld defects, causes and remedy
- Welding Symbols
- Inspection & testing of weldments

Unit 3

- Introduction to safety equipment and their uses
- Setting up of MAG/CO₂ Welding
- Straight line beads on MS plate by CO₂ welding

Unit 4

- Identification of defects by Visual inspection & correction of defects

CWL 105 : WORKSHOP CALCULATION & SCIENCE

Total Credit : 3

Block 1

Unit1

Units- Introduction--Definition--classification of units—inter relationship between Metric and British System of units.

Unit 2

Simplification- Introduction--fractions--decimal fractions--lowest common multiple, LCM.

Unit 3

Square Root - Square and square root--symbol of root--method of finding out the square root of a number- factorization method--division method.

Unit 4 **Ratio & Proportionate-** Introduction--ratio—proportion.

Block 2

Unit 1

Percentage - Introduction--percentage method

Unit 2

Algebra - Introduction-careful consideration of subject items--addition and subtraction--multiplication and division--algebraic formula-factorization--equations

Unit 3

Menstruation - Introduction-rectangle--square--parallelogram— rhombus--trapezium--triangles—circle.

Unit 4

Trigonometry - definition--formula--measurement of angles.

Block 3

Unit 1

Electricity- Introduction--uses of electricity--molecule--atom--atomic structure- - electric current-AC. -DC.--ampere--EMF.--resistance--conductor--insulator--circuit

Unit 2

Electrical Power & Energy- Electric power--electric energy—

Unit 3

Effect of Electrical Current: Introduction---resistance --specific resistance— heating effect of electric current.

Unit 4

Electrical Machine - Introduction---DC. Generator--DC. Motor ratio of transformer

CWL 106: PRACTICAL

Total Credit : 3

Block 1

Unit 1

- Use of protective safety devices on shop floor
- Safe working practice to be observed during welding

Unit 2

- Identification of tools and accessories used for Gas welding
- Setting up Gas welding plant

Unit 3

- Practice brazing with Oxy-Acetylene flame on MS sheets
- Practice tube joint by Oxy-Acetylene welding/ Brazing

Unit 4

- Produce oxy-acetylene gas welded joints in mild steel sheets
 - a. Edge Point
 - b. Square butt joint
 - c. Fillet joint

Block 2

Unit 1

- Setting up Arc welding plant
- Striking an arc and depositing straight and weaving beads on MS in flat position

Unit 2

- Preparation of joints, edge operations.
- Produce arc welding joints in mild steel in flat position.
 - a Fillet Lap & T joints
 - b Inside corner joint
 - c Square butt joint
 - d Single 'V' but joint

Unit 3

- Identification of defects by Visual inspection & correction of defects

Unit 4

- Setting up of Gas cutting plant
- Practice cutting on M.S. plate
- Cutting in flat horizontal and vertical positions
- Cutting nozzle selections for different thickness
- Practice on circular cutting

Block 3

Unit 1

- Setting up of AC and DC TIG Welding plant
- Produce TIG welding jobs
 - a Square butt and corner joint on MS sheet down hand position
 - b T joint on MS sheet
- Bead on practice on SS

Unit 2

- Setting up of MAG/CO2 welding
- Straight line beads on MS plate by CO2 welding

Unit 3

- Produce CO2 welding joints
 - a Lap T & corner joint on MS plate in down hand position
 - b Single 'V' butt joint in down hand position
 - c Single 'V' joint by Flux cored Arc welding
 - d Lap, T & corner joint on MS sheet in vertical down ward position by CO2 welding
 - e Lap, T & corner joint on MS sheet in horizontal down ward position by CO2 welding

Unit 4

- Practical of AC and DC electrical